



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,906	06/21/2001	Tae-Ho Yoon	05823.0204	4767
22852	7590	04/01/2004	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 1300 I STREET, NW WASHINGTON, DC 20005			TSOY, ELENA	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 04/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/884,906

Applicant(s)

YOON ET AL.

Examiner

Elena Tsoy

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 23, 2004 has been entered.

Response to Amendment

2. Amendment filed on February 23, 2004 has been entered. Claims 3 and 4 have been canceled. Claims 1, 2, 5-14 are pending in the application.

Specification

3. Objection to the disclosure because of the informalities has been withdrawn due to amendment.

Claim Objections

4. Objection to claims 8 and 13 because of the informalities has been withdrawn due to amendment.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1762

6. **Claims 1, 5, 6, 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett (US 6,437,026) in view of Ueno et al (US 4,606,930) and Gaku et al (US 4,904,760).

Garrett discloses a method of making a base formulation of EMC by forming a homogeneous mixture (See column 4, lines 7-11) by blending an epoxy resin (See column 3, lines 3-11), hardeners (See column 3, lines 11-18), catalysts (promoters) (See column 3, lines 53-58), silica filler having particle size of 0.5-40 microns and other fillers such as glass (See column 2, lines 56-67). Silane coupling agents may be used in the EMC formulation (See column 3, lines 28-38). It is well known in the art that silane coupling agents improve adhesion of silica to epoxy resin since the silane coupling agents are known to form chemical bonds between silica and epoxy resin (See specification, pages 1 and 2).

Garrett fails to teach that silica surface can be modified by plasma polymerization coating with a monomer such as pyrrole to improve adhesion of silica to epoxy resin (Claim 1).

Ueno et al teach that treating the surface of reinforcing fillers such as glass fibers, carbon fibers, alumina fibers, steel fibers, aramic fibers (See column 1, lines 11-14) by coating the glass fibers using plasma polymerization of a monomer such as pyrrole, quinoline, etc. (See column 2, lines 30-53) can be used to improve adhesion of glass fibers to thermosetting resins (See column 2, lines 20-24), e.g. epoxy resins (See column 2, line 66) by introducing functional groups to the surface (See column 2, lines 59-60).

Ueno et al does not expressly show that reinforcing fillers include silica glass fibers or silica. Gaku et al teach that glass fibers suitable for the use as reinforcing fillers in thermosetting resins (See column 1, lines 8-10) include silica glass fibers (See column 9, lines 57-68).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have treated silica of Garrett using plasma polymerization of pyrrole with the expectation

Art Unit: 1762

of providing silica with the desired improved adhesiveness to epoxy resin, since Ueno et al teach that plasma treating of reinforcing fillers such as glass fibers improves adhesiveness to epoxy resin, and Gaku et al teach that glass fibers suitable for the use as reinforcing fillers in thermosetting resins include silica glass fibers.

As to claim 9, it is the Examiner's position that the plasma polymerization coating would be effective to enhance the flexural strength of the EMC of Garrett in view of Ueno et al and Gaku et al since it is produced by a method identical or substantially identical processes to that of claimed invention.

7. **Claims 2, 10, 11, 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett (US 6,437,026) in view of Ueno et al (US 4,606,930) and Gaku et al (US 4,904,760), further in view of Nakayama et al (US 4,619,861).

Garrett in view of Ueno et al and Gaku et al fails to teach that the method comprises the steps of charging silica into a plasma polymerization reactor, followed by vacuuming to 1×10^{-3} torr; introducing the monomer and rotating the reactor at 1-50 rpm at plasma polymerization conditions: plasma power (10-40 W), gas pressure (40-50 mtorr) and treatment time (20-40 seconds) (Claim 2).

Nakayama et al teach that a plasma polymerization of monomers such as quinoline (See column 3, line 62) for introducing functional groups to the particle surface can be carried out by charging particles to be coated into a plasma polymerization reactor followed by vacuuming the reactor to 1×10^{-2} torr or more (See column 5, lines 22-23); introducing the monomer such as quinoline (See column 3, line 62) and rotating the reactor at 20-70 rpm (See column 5, lines 19-44) .

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have carried out a plasma polymerization of monomers such as pyrrole, quinoline in Garrett in view of Ueno et al and Gaku et al on silica surface by charging silica into a plasma polymerization reactor, followed by vacuuming the reactor to 1×10^{-2} torr or more, introducing the monomer and rotating the reactor at 20-70 rpm with the expectation of providing the silica surface with desired functional groups, as taught by Nakayama et al.

As to the power of 10-40 W and treatment time, it is well known in the art that power level and treatment time are result-effective parameters in plasma polymerization coating process.

It is held that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant polymerization coating process parameters (including claimed power level of 10-40 W and claimed treatment time of 20-40 seconds) in a plasma polymerization process of Garrett in view of Ueno et al and Gaku et al in view of Nakayama et al through routine experimentation in the absence of a showing of criticality.

8. **Claims 7, 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett (US 6,437,026) in view of Ueno et al (US 4,606,930) and Gaku et al (US 4,904,760), further in view of Emler et al (US 4,690,107).

Garrett in view of Ueno et al and Gaku et al fails to teach that the method further comprises introducing the homogeneous mixture into the mold (Claim 7) such as silicone rubber mold (Claim 8).

Emler et al teach that reinforced epoxy mass can be molded using a silicone rubber mold (See column 8, lines 4-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a silicone rubber mold for molding a homogeneous epoxy resin mixture of Garrett in view of Ueno et al and Gaku et al since Emler et al teach that reinforced epoxy mass can be molded using a silicone rubber mold.

9. **Claims 12, 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett (US 6,437,026) in view of Ueno et al (US 4,606,930) and Gaku et al (US 4,904,760), further in view of Nakayama et al (US 4,619,861), and further in view of Emler et al (US 4,690,107).

Garrett in view of Ueno et al and Gaku et al in view of Nakayama et al fails to teach that the method further comprises introducing the homogeneous mixture into the mold (Claim 12) such as silicone rubber mold (Claim 13).

Emler et al teach that reinforced epoxy mass can be molded using a silicone rubber mold (See column 8, lines 4-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a silicone rubber mold for molding a homogeneous epoxy resin mixture of Garrett in view of Ueno et al and Gaku et al in view of Nakayama et al since Emler et al teach that reinforced epoxy mass can be molded using a silicone rubber mold.

Response to Arguments

10. Applicant's arguments with respect to claims 1, 2, 5-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (571) 272-1429. The examiner can normally be reached on Mo-Thur. 9:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETsoy

Elena Tsoy
Examiner
Art Unit 1762

March 29, 2004